

Amendments to the Claims

The current listing of the claims replaces all previous amendments and listings of the claims.

1. (Currently Amended) A ceramic heater system comprising:

a heater base ~~monolithically~~ integrally formed of a ceramic material,

the heater base ~~including~~ comprising:

a mounting surface ~~which is~~ formed as an upper surface of the heater base and ~~on which~~ configured to receive an object is mounted thereon,

a heater, ~~buried~~ disposed in said heater base, ~~for heating~~ and configured to heat the object, and

a fluid gas passage provided in said heater base below said heater, said ~~fluid~~ gas passage ~~having~~ formed in a lower surface of the heater base and comprising a fluid gas inlet and fluid gas outlets formed in a lower surface of the heater base configured to feed a gas into and out from the gas passage, the gas passage comprising a plurality of first passages disposed concentrically in the heater base and a plurality of second passages connecting the plurality of first passages without being aligned in a direction towards a center of concentricity of the plurality of first passages,

wherein said heater base is configured to be cooled by causing a fluid whose feeding the gas having a temperature is lower than a temperature of said heater base to be supplied through said fluid to the gas passage.

2. and 3. (Canceled)

4. (Currently Amended) The ceramic heater system according to claim ~~[[2]]~~ 1, wherein ~~said fluid passage has a fluid~~ the gas inlet is formed in a central portion of a lower surface of said heater base, and ~~fluid~~ the gas outlets are formed in outer circumference portions of the lower surface of said heater base.

5. (Currently Amended) The ceramic heater system according to claim 1, wherein ~~said fluid which flows in said fluid passage is~~ the gas comprises at least one gas selected from of Ar, He, Ne and N₂ gases ~~or a mixed gas thereof~~.

6. (Currently Amended) The ceramic heater system according to claim ~~[[5]]~~ 1, wherein said ~~mixed~~ gas ~~contains~~ comprises Ar and He.

7.-8. (Canceled)

9. (Currently Amended) The ceramic heater system according to claim 1, wherein said heater has a high-melting-point metal patterned in ~~such~~ a coil form as to evenly generate heat in said heater base ~~and two zones~~.

10. (Currently Amended) The ceramic heater system according to claim 1, wherein said heater ~~is formed of~~ comprises one of graphite ~~or~~ and glassy carbon shaped in ~~such~~ a pattern as to evenly generate heat in said heater base.

11. (Currently Amended) The ceramic heater system according to claim 10, wherein said heater ~~has~~ comprises one of glassy boron nitride coated on an outer surface of graphite ~~or~~ and glassy carbon ~~of which said heater is formed~~.

12. (Currently Amended) The ceramic heater system according to claim 1, further comprising:

an electrode ~~buried~~ disposed in said heater base and located between the heater and the mounting surface; and

power supply means for applying a ~~DC~~ direct current voltage to said electrode,

wherein, ~~when the voltage is applied to the electrode,~~ an electrostatic chuck is configured to be formed when the voltage is applied to the electrode, the electrostatic chuck ~~being for~~ configured to one of electrostatically ~~attracting or repulsing~~ attract and detach the object mounted on the heater base, and the electrostatic chuck and the heater ~~forming~~ form a one-body structure.

13.-16. (Canceled)

17. (Currently Amended) The ceramic heater system according to claim 1, wherein ~~said fluid passage has a fluid~~ the gas inlet is formed in a central portion of a lower surface of said heater base, and ~~fluid~~ the gas outlets are formed through circumferential side walls of said heater base.

18. (Currently Amended) A ceramic heater system comprising:

an upper heater base ~~monolithically~~ integrally formed of a ceramic material; and

a lower heater base formed of a ceramic material, the upper heater base and the lower heater base forming a one-body heater base, with a lower surface of the upper heater base ~~being in tight contact with~~ contacting the lower heater base,

the one-body heater base ~~including~~ comprising:

a mounting surface ~~which is~~ formed as an upper surface of the upper heater base and ~~on which~~ configured to receive an object ~~is mounted~~ thereon,

a heater, ~~buried~~ disposed in said upper heater base, ~~for heating~~ and configured to heat the object, and

a ~~fluid~~ gas passage ~~provided in the lower surface of~~ below the heater and formed on the upper heater base and the lower heater base, the gas passage formed as a groove through which a fluid is supplied toward the mounting surface, the fluid passage having a fluid inlet and fluid outlets in a lower surface of the lower heater and comprising a gas inlet and gas outlets configured to feed a gas into and out from the gas passage, the gas passage comprising a plurality of first passages disposed concentrically in the lower heater base and a plurality of second passages connecting the plurality of first passages without being aligned in a direction toward a center of concentricity of the plurality of first passages,

wherein said ~~upper and lower heater base is~~ bases are configured to be cooled by
~~causing a fluid whose feeding the gas having a temperature [[is]]~~ lower than a temperature of
the upper heater base ~~to be supplied through the fluid to the gas passage.~~

19. (Currently Amended) A ~~substrate~~ processing apparatus comprising:

a chamber ~~whose defining an interior can be kept in~~ configured to achieve a vacuum
state by an exhaust system;

a ceramic heater system ~~which is provided~~ disposed in the chamber and ~~which heats~~
configured to heat an object; and

processing means for performing a predetermined treatment on ~~said a~~ substrate in said
chamber,

said ceramic heater system ~~including~~ comprising,

a heater base ~~monolithically~~ integrally formed of a ceramic material,

a mounting surface ~~which is~~ formed as an upper surface of the heater base and ~~on~~
~~which an~~ configured to receive the object is mounted thereon,

a heater, ~~buried~~ disposed in said heater base, ~~for heating and~~ configured to heat said
object, and

a ~~fluid gas~~ passage provided in said heater base below said heater, the ~~fluid gas~~
passage having formed in a lower surface of the heater base and comprising a fluid gas inlet
and fluid gas outlets formed in a lower surface of the heater base configured to feed a gas into
and out from the gas passage, the gas passage comprising a plurality of first passages
disposed concentrically in the heater base and a plurality of second passages connecting the
plurality of first passages without being aligned in a direction towards a center of
concentricity of the plurality of first passages,

wherein said heater base is configured to be cooled by ~~letting a fluid whose~~ feeding the gas having a temperature ~~[[is]]~~ lower than a temperature of said heater base ~~flow in said fluid to the gas~~ passage.

20. (Currently Amended) The ~~substrate~~ processing apparatus according to claim 19, wherein said processing means ~~includes~~ comprises:

a process-gas supply mechanism ~~for feeding~~ configured to feed a process gas; and

a shower head, ~~provided~~ disposed in said chamber at a ceiling thereof, ~~for introducing and configured to introduce~~ said process gas from said process-gas supply mechanism to form a film on the substrate by a reaction of the process gas;

~~whereby a film is formed on said substrate by a reaction of said process gas.~~

21. (Currently Amended) The ~~substrate~~ processing apparatus according to claim 20 19, further comprising:

a high-frequency power supply~~[[,]]~~ connected to said shower head, ~~for~~ and configured to electrically isolate said shower head and ~~applying~~ apply high-frequency power to said shower head; and

a lower electrode embedded in the heater base and located between an upper surface of the heater base and the heater,

wherein the shower head is configured such that plasma is generated by applying the high-frequency power to the shower head in the chamber which is in a gaseous atmosphere supplied with the process gas from the shower head, and a film is formed on the object by a reaction of the process gas with the plasma.

22. (Currently Amended) The ~~substrate~~ processing apparatus according to claim 19, wherein said processing means ~~includes~~ comprises:

a gas feeding mechanism ~~for feeding~~ configured to feed an etching gas,

an electrically isolated shower head, ~~provided~~ disposed in said chamber at a ceiling thereof, ~~for introducing and configured to introduce~~ a process gas from said gas feeding mechanism,

a high-frequency power supply[[,]] connected to said shower head, ~~for applying and configured to apply~~ high-frequency power to said shower head, and

a lower electrode embedded in the heater base and located between the heater base and the heater,

wherein the shower head and the lower electrode are configured such that, when the high-frequency power is applied to the shower head and/or the lower electrode in a chamber atmosphere into which the etching gas is supplied from the shower head, plasma is generated and a surface of the object is etched by a reaction of the etching gas.

23.-25. (Canceled)

26. (Currently Amended) The ceramic heater system according to claim 1, wherein the ceramic material ~~includes~~ comprises at least one of a nitride-based metallic material having a high melting point and an oxide-based metallic material having a high melting point.

27. (Currently Amended) The ceramic heater system according to claim 26, wherein the nitride-based metallic material [[is]] comprises AlN.

28. and 29. (Canceled)

30. (Currently Amended) The ceramic heater system according to claim 18, wherein ~~the fluid passage has a fluid~~ the gas inlet is formed in a central portion of a lower surface of the heater base, and ~~fluid~~ the gas outlets are formed in outer circumference portions of the lower surface of the heater base.

31. (Currently Amended) The ceramic heater system according to claim 18, wherein ~~the fluid supplied through the fluid passage is a~~ the gas ~~selected from the group consisting of~~

comprises at least one of Ar, He, Ne and N₂, or a mixture gas of gases selected from the group.

32. (Currently Amended) The ceramic heater system according to claim 31, wherein the ~~mixture gas contains~~ comprises Ar and He.

33.-35. (Canceled)

36. (Currently Amended) The ceramic heater system according to claim 18, wherein the heater is comprises a winding ~~which is made including~~ of a high-melting point metallic material and ~~which has having~~ a pattern ~~that enables an internal region of the heat base to be~~ to uniformly heated heat an internal region of the heater base.

37. (Currently Amended) The ceramic heater system according to claim 18, wherein the heater is ~~made of~~ comprises one of graphite ~~or and~~ vitreous carbon and has a pattern ~~that enables an internal region of the heater base to be~~ to uniformly heated heat an internal region of the heater base.

38. (Currently Amended) The ceramic heater system according to claim 37, wherein the heater is ~~made by coating~~ comprises vitreous boron nitride over outer surfaces of at least one of graphite ~~or and~~ glass carbon.

39. (Currently Amended) The ceramic heater system according to claim ~~18~~ 19, further comprising:

an electrode ~~buried~~ disposed in the heater base and located between the heater and the mounting surface, and

power supply means for applying a voltage to the electrode,

wherein, ~~when the voltage is applied to the electrode in an ON state,~~ an electrostatic chuck is configured to be formed when the voltage is applied to the electrode, the electrostatic chuck ~~being for~~ configured to one of electrostatically ~~attracting or repulsing~~ attract and detach the object mounted on the heater base, ~~and when no voltage is applied to~~

~~the electrode in an OFF state, no electrostatic chuck is formed,~~ the electrostatic chuck and the heater forming a one-body structure.

40. (Currently Amended) The ceramic heater system according to claim 18, further comprising:

a ~~fluid~~ gas supply source configured to output ~~a fluid~~ the gas to be supplied through the ~~fluid~~ gas passage;

a temperature control unit configured to control the ~~fluid~~ gas from the ~~fluid~~ gas supply source such that the ~~fluid~~ gas has a temperature within a predetermined range, and to supply the ~~fluid~~ gas into the ~~fluid~~ gas passage; and

a heat exchanger configured to remove heat provided by the heater base from the ~~fluid~~ gas,

wherein ~~the fluid is made to circulate via~~ the ~~fluid~~ gas supply source, the temperature control unit, the fluid passage and the heat exchanger, ~~while being simultaneously controlled in temperature~~ are configured to simultaneously circulate and control the temperature of the ~~gas.~~ gas.

41. (Currently Amended) The ceramic heater system according to claim 18, wherein the ~~fluid~~ gas passage has an ~~increased~~ internal surface area, ~~thereby providing an improved~~ configured to provide a predetermined heating/cooling efficiency.

42. (Currently Amended) The ceramic heater system according to claim 41, wherein ~~an internal surface area of the fluid passage is formed by~~ the gas passage comprises a heat-radiation fin disposed on a heater side and a roughened inner surface disposed on the heater ~~side.~~ side.

43. (Canceled)

44. (Currently Amended) The ceramic heater system according to claim 18, wherein the upper heater base and the lower heater base are coupled together by use of at least one of a ceramic adhesive ~~or~~ and a screw.

45.-55. (Canceled)

56. (Currently Amended) A ceramic heater system comprising:

a heater base ~~monolithically~~ integrally formed of a ceramic material,

the heater base ~~including~~ comprising:

a mounting surface ~~which is~~ formed as an upper surface of the heater base and ~~on~~ which configured to receive an object is mounted thereon;

a heater ~~for heating~~ configured to heat the object, the heater ~~being buried~~ disposed in said heater base and having a high-melting-point metal patterned in ~~such~~ a coil form as to evenly generate heat in the heater base; and

a ~~fluid~~ gas passage provided in said heater base below said heater, the gas passage formed in a lower surface of the heater base and comprising a gas inlet and gas outlets configured to feed a gas into and out from the gas passage, the gas passage comprising a plurality of first passages disposed concentrically in the heater base and a plurality of second passages connecting the plurality of first passages without being aligned in a direction towards a center of concentricity of the plurality of first passages,

wherein said heater base is configured to be cooled by ~~causing a fluid whose~~ feeding the gas having a temperature is lower than a temperature of said heater base to be supplied through said fluid to the gas passage.

57. (Canceled)

58. (Currently Amended) The ceramic heater system according to claim 56, further comprising:

an electrode ~~buried~~ disposed in the heater base and located between the heater and the mounting surface; and

power supply means for applying a voltage by one of a ~~DC~~ direct current supply and high-frequency power supply to the electrode,

wherein, ~~when the voltage is applied to the electrode,~~ an electrostatic chuck is configured to be formed when the voltage is applied to the electrode, the electrostatic chuck ~~being for configured to at least one of electrostatically attracting or repulsing~~ attract and detach the object mounted on the heater base, and the electrostatic chuck and the heater ~~forming~~ form a one-body structure.

59. (Currently Amended) The ceramic heater system according to claim 56, wherein the fluid gas passage has an ~~increased~~ internal surface area, ~~thereby providing an improved~~ configured to provide a predetermined heating/cooling efficiency.

60. (Currently Amended) The ceramic heater system according to claim 56, wherein the fluid gas passage ~~has~~ comprises a heat-radiating fin disposed on a heater side and a roughened inner surface ~~located~~ disposed on the heater side.

61. (Canceled)

62. (Currently Amended) The ceramic heater system according to claim 18, wherein the ceramic material ~~includes~~ comprises at least one of a nitride-based metallic material having a high melting point and an oxide-based metallic material having a high melting point.

63. (Currently Amended) The ceramic heater system according to claim 1, wherein the fluid gas passage has an ~~increased~~ internal surface area, ~~thereby providing an improved~~ configured to provide a predetermined heating/cooling efficiency.

64.-66. (Canceled)

67. (Currently Amended) The ceramic heater system according to claim 19, ~~wherein~~ further comprising:

a gas supply source and a gas discharge line connected to the fluid gas inlet and the fluid gas outlets of the fluid gas passage are connected to a fluid supply source and a fluid discharge line.

68.-74. (Canceled)

75. (Currently Amended) The ceramic heater system according to claim 9, wherein the high-melting-point metal is comprises at least one of W, Mo and Pt.

76. (Currently Amended) The ceramic heater system according to claim ~~36~~ 56, wherein the high-melting point metal ~~includes a metal selected from the group consisting~~ comprises at least one of W, Mo, ~~or~~ and Pt.